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APRIL 1972

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COVER:

Hi—ho, come to the fair!

TRANSPO 72 is the transportation show of the century, but if you are flying in you need advance briefing. See page 6.

FAA AVIATION NEWS

DEPARTMENT OF TRANSPORTATION / FEDERAL AVIATION ADMINISTRATION VOL. 10, NO. 11

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ALTERNATE FUELS

Manufacturers are cautious about the possible effects of lead from higher octane gasolines.

Editor's Note: The first part of this article, printed in the March issue of FAA AVIATION NEWS, explained the basis of octane ratings and their significance to the aircraft engine, and published the latest Lycoming service bulletin on this subject. The conclusion of this article in the present issue contains the latest Continental bulletin on fuels.

Continental's bulletin on alternate fuels for 80/87 (and 91/96) grade fuels cautions that continued use of low lead 100/130 avgas could result in reduced service life of the engine and lead to such problems as exhaust valve stem erosion, intake valve burning, and spark plug erosion.

Continental says that sodium cooled exhaust valves "may not be adversely affected. We do not know the effect on the intake valves."

More frequent cleaning of plugs, because of lead fouling, may be necessary, Continental predicts. Selection of hotter spark plugs may be desired, and 100-hour compression checks are advised.

On horizontal engines, lead fouling of the lower plugs only is sometimes observed (lead globules are seen on the plug). Exchanging the lower plugs with the upper ones may improve the ignition, as the lead is burned off during combustion.

At the moment 80/87 avgas is still available in most sections of the country, and will probably continue to be supplied at least until much more has been learned about the tolerance of airplane engines to lead. Theoretically, it is possible to produce sufficiently high octane grades with no lead at all present, but the economic and ecological aspects of such a product will have to be considered. The aromatic hydrocarbons which would replace tetraethyl lead (TEL) are more expensive, and some result in highly reactive by-products after combustion. Substituting new pollutants for old ones will not help the environment. Furthermore, an engine designed to operate in the presence of a given quantity of lead as a valve seat lubricant could be harmed by the total absence of TEL.

In the meantime pilots and aircraft operators should bear in mind that the grade of fuel specified for their engine is the safest to use, and that if circumstances oblige them to use a higher octane continuously, they should keep up with the latest recommendations of their engine manufacturer. Owners of older aircraft, for which the specified grades are no longer available, should be particularly careful about the use of alternate fuels, and the necessary associated maintenance and operating procedures. For example, it might be advisable to avoid excessive leaning of the fuel mixture at cruise, since lead damage to valves is more likely when engine head temperatures are high.

Incidentally, you should NEVER use automobile gas in an airplane engine, even if it is of equal octane rating or better, because different methods are used to rate the two types of fuel. Furthermore, the lead used in auto fuels is different from that in avgas; it contains an excess of chlorine and bromine, while avgas has only the chemically correct amount of bromine. Chlorine, which is very corrosive, could lead to exhaust valve failures.

Automotive fuels are more volatile and have a vapor pressure of 8 to 14 pounds psi as compared to 5 to 7 pounds in avgas. The lower vapor pressure in the aviation fuel helps prevent vapor lock from altitude or heat. The greater volatility of car fuel, conversely, increases the fire hazard.

Automobile fuels also have a wider distillation range than aircraft fuels, which results in less effective distribution of the anti-knock components of the fuel.

Finally, auto fuels are less stable and more apt to form gum deposits, which can result in valve sticking, poor distribution and other malfunctioning. In ground and tank operation tests made on aircraft engines, it was found that the only way such engines could be made to use such fuels successfully was by making wide changes in clearances, limits, and other design features. The use of auto gas in a plane is considered to be so harmful that it may result in the cancellation of the airplane engine warranty.

Advisory Circular 91-33, "Use of Alternate Grades of Aviation Gasoline for Grade 80/87," is available free on request from the DOT Distribution Unit, TAD 484.3, Washington, D.C. 20591.

Continental Service Bulletin M71-9

"We continue to recommend use of 80/87 fuel where specified. When 80/87 fuel is not available, it is permissible to operate the engine on low-lead-content 100/130. **Owners and operators are hereby advised that continued use of the new 100/130 low-lead-content fuel could result in reduced service life of these engines.** Because of this consideration, we recommend that a compression check be taken and recorded at each 100-hour interval after initial use of 100/130 octane fuel. Results of each check should be carefully analyzed against the previous check to assist in detection of engine difficulty before failure occurs.

"Use of the 100/130 fuel can cause, but is not limited to, the following conditions:

1. Exhaust valve stem erosion in the hot areas
2. Intake valve burning
3. Spark plug gap erosion

"Changing the following components will assist in maintaining the service life of your engine. Upon indications of engine difficulty, or when the cylinders must be removed for any reason, we recommend use of the exhaust valve part number 629404 for engine models:

C75	O200	O300
C85	C125	
C90	C145	

"We recommend use of the exhaust valve part number 631639 for the GO-300 engine (See [Continental] Bulletin M64-14). Use of intake valve part number 531608 is recommended for all the above-mentioned engine models. This has been in use in the GO-300 both new and remanufactured, for several years.

"Owners and operators are further cautioned that use of new fuels will require that the spark plugs be cleaned more frequently because of possible excessive lead fouling. We recommend use of spark plugs as follows:

C75	539433 (AC-S88-S-88D) or 625351 (AC-SR88-SR88D) or 630378 (Champion EM42E) 635863 (Champion EM41E) 627643 (Champion REM40E)
C85	"
C90	"
O-200	"
O-300	"
C125	"
C145	"
GO-300	627449 (AC-SR-87) 627643 (Champion REM40E)

"There are no special valves for use with 100/130 octane fuel available for the A65 and A75 models, since these went out of production over 20 years ago. The same compression checks described above at 100-hour inspecton intervals are recommended for these models. Use only spark plugs on the approved list, selecting a hotter plug if excessive lead fouling prevails.

"We do not have any experience with the use of 100/130 fuel in W670 models. They do use a sodium-cooled exhaust valve which may not be adversely affected. We do not know the effect on the intake valves. No alternate valves are available. Here also, experience will have to be gained through periodic compression checks. Selection of a hotter spark plug from the approved list may be necessary.

"IO-346, E185, E225, O-470 and IO-470 models that are rated on either 80/87 or 91/96 fuel use valves that are compatible with 100/130 fuel. If excessive lead fouling prevails, selection of a hotter plug from the approved list may be necessary. In extreme cases, selection of a platinum or iridium fine wire spark plug may provide additional relief."

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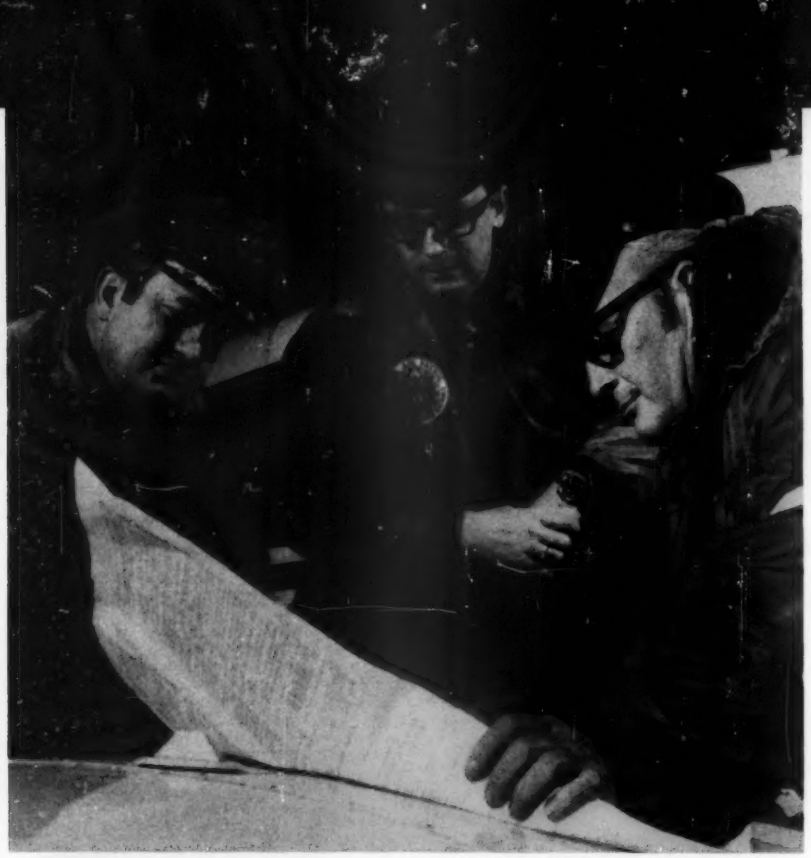


Time is the deadly enemy of the downed pilot: every hour that goes by lessens his chance of survival. Knowing where to look is more than half the battle.

Fowler's Fate

How the Civil Air Patrol Hunts Lost Pilots

Arthur E. Fowler, 47, of Miramar, Fla., left his car in the parking lot at Opa-Locka Airport and went directly to his single-engine "six," bypassing his customary stop at the operations office. He had a long day's flying ahead, all the way to Albany, N.Y., where he intended to have dinner with his daughter and her husband. He was running behind schedule and in his haste to get into the air he felt he could afford to skip the flight plan filing, just this once. He cut short the walkaround, too, boarded the plane, started the engine and began taxiing.

Ten o'clock that evening his daughter called the Miramar home to find out why Dad had not kept his dinner date. *Had he changed his plans and laid over en route?* Possibly, Mrs. Fowler thought. Her husband occasionally made a refueling stop at Washington, D.C., where his brother lived. But a call there ruled out that possibility.

Now becoming alarmed, Mrs. Fowler called FAA's Miami FSS. Miami, of course, had no information—no flight plan, no record of enroute radio contacts, nothing to go on, except confirmation from Opa-Locka that N43 Whisky was not on the parking apron. After due consideration, the FSS notified the Eastern Aerospace Rescue and Recovery Center at Eglin Air Force Base, Fla., thereby launching a search activity that was to involve some 700 persons and 121 airplanes flying 196 sorties. The search area extended over Florida, Georgia, South and North Carolina, Virginia, Maryland, Pennsylvania, and New York—about 35,000 square miles.

These activities were conducted under the National Search and Rescue (SAR) Plan, which designates the Coast Guard as the executor of maritime area searches and the Air Force as responsible for inland searches. There are three regional overland Aerospace Rescue and Recovery Service Centers: the eastern center at Eglin AFB, already mentioned; the mid-continent center at Richards-Gebaur AFB near Kansas City, and the western center at Hamilton AFB, near San Francisco.

Because military aircraft under control of these three centers are usually committed or in reserve as support for military or space missions, civilian search is mainly carried out by the Air Force civilian auxiliary, the Civil Air Patrol.

The Civil Air Patrol is composed of some 73,000 members including about 38,000 senior members, of whom 17,690 are pilots qualified to participate in missions in support of search, civil defense, or disaster relief operations. The other members are cadets, in various stages of training.

The CAP fleet consists of more than 6,500 privately owned and corporate (CAP) aircraft. Senior pilots serve on a voluntary standby status: they are not compensated for any services, merely reimbursed for fuel and oil expended on authorized missions. They come from all walks of life, and they contribute their aircraft, their skills, time, training—and sometimes even their lives—to the public interest. In some instances they also risk their jobs, since not all employers take kindly to their "voluntary firemen" status.

The flying elements of the CAP are organized into state wings, and overall supervision is provided by a national commander, currently Air Force Brig. Gen. Richard N. Ellis, headquartered at Maxwell AFB, Ala.

In the Fowler case, as soon as the FAA alert came into the center at Eglin an extended communications check was begun. With no flight plan involved, it was first of all necessary to determine as far as possible whether an aircraft and pilot were actually missing and had gone down. Rescue personnel have learned from years of experience that coincidence has a surprisingly long arm, and that you cannot always conclude from the absence of an airplane and its owner from their usual whereabouts that both have departed in the same direction. Planes are borrowed sometimes, and pilots occasionally take the commercial carrier, or even the train, in the face of bad weather.

The Fowler communications check began with telephone calls to all members of his family, to his business associates, fellow flyers, golfing companions, etc.—to anyone who might shed light on the missing pilot's personal and flying habits. The objective was to construct an informational profile of Fowler as a possible aid to his present location. Simultaneously the SAR center contacted all airports within 50 miles of the presumed route of flight and his intended destination, Albany, N.Y. This is always a tedious, time-consuming operation (literally hundreds of airports had to be called, for example), but a necessary one; the Air Force does not want to wrench civilian pilots away from their families and normal routine to fly in all kinds of weather searching for a pilot who eventually turns up at a snug hunting hide-away.

Another reason for the extensive pre-search investigation is the importance of

narrowing the prospective search area as much as possible. The chances of finding a small plane like Fowler's in an area as vast as virtually the entire Atlantic coast south of Albany, in time to render lifesaving assistance, is exceedingly slim, no matter how many search craft are put into the air.

Nevertheless, a massive search effort was launched over a broad corridor along the apparent path of flight, with CAP wings from all eight states in the area participating. They were hampered by poor weather, as well as a total absence of clues, necessitating a painstaking section by section search, using flight patterns adapted to varying terrain.

Persons inexperienced in air rescue work often imagine that a downed plane will stick out like a sore thumb: quite the opposite is true. As a general rule, light aircraft that crash disappear almost completely from sight, imbedded in a swamp or lake, swallowed up in a woods, buried under snow, etc. The trained searcher does not expect to see a whole airplane, or even the skeleton of one. He looks for a wing fragment, a tail section, a charred spot in a meadow, a break in the trees, an odd shadow on the snow.

What makes air rescue work of the Civil Air Patrol hazardous is the need for flying at fairly low altitudes while scanning the ground beneath intently. Box canyons, narrow draws and other areas that pilots would ordinarily stay well away from are sometimes flown into by CAP pilots to investigate possible signs of wreckage. They are all conscious of time as an important factor in locating survivors, knowing that statistics show that the chances of surviving a crash decrease by 80 percent after the first 24 hours. The coming general use of electronic locater transmitters will help, but these will still require some criss-cross tracking because the search plane, in most cases, will not be able to home in directly on the target.

In Fowler's case, it was four days before the wreckage of his airplane was located near the Florida-Georgia border. He had apparently become disoriented, in what was reported as rapidly deteriorating weather, lost control and crashed into a desolate area at the edge of Okefenokee Swamp. The ground rescue team directed by CAP to the site found the pilot already dead. A subsequent examination showed that he had not been killed on impact, and that his injuries might not have proved fatal if he had been found sooner and rushed to a hospital.

He could have been found sooner—a lot sooner—if he had taken the few minutes needed to file that flight plan. Similarly, if he had described his situation to the nearest FSS as soon as he found himself having weather problems, the rescue search could have been pinpointed. He need not have declared an emergency—it would have been enough to identify himself and his location.

For those who would escape Fowler's fate, the Civil Air Patrol's Director of SAR activities, Major John C. Cody, USAF, advises:

"Flying cross-country without a flight plan is like flying without life insurance when it is there free for the asking. Some pilots apparently are reluctant to file because they feel they would be liable to action by FAA if they failed to carry it out. That is not the case—you can cancel or alter it at any time."

As a means of enhancing your insurance, Major Cody suggests that the cross-country pilot follow up his flight plan with periodic radio reports. "When you get a navigational fix, call the facility serving that area and give them position and ETA to the next fix. Also advise them when you feel it necessary to deviate from course for weather or other reasons. If you do this regularly, you provide the ground controllers with a record from which they easily compute the general area of an accident."

Cody also recommends that a downed pilot recognize the difficulty of his would-be rescuers' task in spotting him from the air and help out, if he is able, by lighting flares or a smoke fire, signaling with a mirror or flashlight, or activating the radio if possible. He warns pilots against over-dependence on electronic locater transmitters.

"They will help us a great deal, of course, provided that they function as intended, that their power source is kept up, and that the crash site does not impede the transmissions too seriously. What concerns us is the possibility that some pilots may adopt the attitude that nothing can harm them as long as they have an ELT on the airplane. They might think of it as some magic gadget that allows them to desregard all the safety procedures we have been preaching all along. That could be a fatal mistake."

("Fowler's Fate" is based on a CAP mission, with names and some incidents altered.)

Left—CAP is preparing for more widespread use of emergency locator transmitters (ELTs) by including them in practice missions. The ELT, when functioning properly, may shorten the time needed to find a downed aircraft, but will not replace the flight plan, which narrows the field of the search. **Below**—search flying means moving low and slow, usually over rough terrain, looking for minute clues, like a fresh break in the foliage, a brief reflection or a blackened meadow.

Dulles International Airport. TRANSPO 72 buildings are visible at left of terminal.

General aviation pilots planning to fly in to TRANSPO 72, the United States International Transportation Exposition to be held near Washington, D. C., from May 27 to June 4, are advised that special arrangements are being made to handle the heavy influx of air traffic expected during the Exposition.

TRANSPO 72 will be located on a 360-acre site adjacent to and east of Runway 19R at Dulles International Airport, which itself is composed of more than 10,000 acres. An architectural marvel in airport design, Dulles was intended primarily as a jetport, but it also has a flourishing general aviation area with sod parking facilities for 400 transient TRANSPO 72 light aircraft. About 30 hard surface parking spaces are available for aircraft over 12,500 lbs. Pilots of light aircraft must supply tiedowns.

Originally conceived as an air show only, TRANSPO 72 has burgeoned into the most exciting and ambitious transportation exposition on record in the United States. In addition to exhibits of virtually every current and near-future form of transport on land, sea and in the air, the show will portray the entire history of human mobility from the invention of the wheel to interplanetary travel. TRANSPO 72 is dedicated to the improvement of transportation in every sector of human activity, from intracity commuting to intercontinental flight. The latest forms of air-cushioned surface vehicles will be shown, as well as vertical and short field takeoff and landing aircraft (V/STOLs).

On hand also will be prototypes of electronically guided automobiles, 300 mph turbine trains, and various kinds of futuristic transportation terminals and communications systems. The lake adjoining the site will accommodate new models of shallow-draft watercraft, as well as undersea exploratory devices. TRANSPO 72 will function like a modern city, with emphasis on pollution-free atmosphere.

Entertainment will include precision aerobatic flying by United States and foreign military teams, hot air balloon demonstrations, and sky diving.

To operate in or out of Dulles Airport during the ten days of TRANSPO 72, pilots should have a TRANSPO Control Number, obtainable in advance by writing:

TRANSPO Control Number
Dulles International Airport
P.O. Box 17204
Washington, D. C. 20041
Telephone: (703) 471-4830

In applying you will need to provide your aircraft number, pilot's last name, expected length of stay, and date and time of estimated arrival and departure. The control procedure will be used to insure an orderly flow of air traffic at all times, to minimize delays and avoid the arrival of aircraft during the brief periods when the airport will be closed for aerial demonstration flights. Nevertheless, some delays may be anticipated, especially in IFR weather.

A special flight service station will be established on the TRANSPO site for the convenience of pilots, but will not have any air/ground communications facilities. Flight plans should be filed for all flights during the show, with Control Numbers provided as well as "N" number. Flight plans should be opened and closed with the FSS, and not with Dulles tower, ground or approach control.

Specific VFR departure patterns, as well as IFR arrival and departure procedures, have been prescribed for the various runways. Details are available in the Airman's Information Manual, and from the FSS's in the area.

Having a Control Number will not assure anyone of parking space at Dulles, which will be given out on a space available basis. Transient aircraft which cannot be accommodated at Dulles during TRANSPO 72 will have a choice of eight general aviation airports located within a radius of 25 nautical miles, with tie-down facilities for a total of over 1,000 aircraft. (Estimates of the number of private aircraft expected to fly in during the exposition are in the area of several thousand.)

Temporary FAA towers will be set up at three of the closest small airports near Dulles: Glascock, Leesburg, and Manassas. Washington National Airport, one of the busiest air carrier airports in the country, also has some general aviation tie-downs, although available space during TRANSPO is expected to be scarce. Washington National has direct limousine service to Dulles, about a half-hour trip (under normal conditions). For details on airports in the vicinity, see chart and boxed summary.

Frequencies

ATIS (Arrival)	120.95
ATIS (Departure)	113.5
Washington FSS	122.6 transmit
and receive (FSS on TRANSPO site)	
Dulles Approach VFR	125.5 (East)
	125.05 (West)
Dulles Approach IFR	126.1 (East)
	119.2 (West)
Dulles Tower	120.1
Dulles Departure	132.35
Dulles Ground	121.9
Weather	122.0
Manassas Tower	122.4 G 121.6
Leesburg Tower	122.5 G 121.8
Glascock Tower	120.5

Dulles Airport will be closed for periods of 15 to 30 minutes at various times for high performance aircraft aerial demonstrations, and Runway 01L/19R will generally be closed during the exposition, while parts of certain taxiways will be utilized for general aviation takeoffs. Pilots should monitor Dulles ATIS for current information.

Special VFR requests may be subject to indefinite delay. All pilots are cautioned to be alert to wake turbulence from the large jets using Dulles Airport, and to heavy jet traffic in the area above 7,000 feet between Dulles and Baltimore.

Arthur Godfrey Field, Leesburg, Va., 13 road miles NW of Dulles.

Glascock Airport at Arcola, Va., a meadow-turned-airport, only four miles west of Dulles' Runway 12, will be open to the public with one 2,600′ sod strip (18-36), 80-octane fuel and parking on the grass.

Harry P. Davis Field, Manassas, Va., 17 road miles south of Dulles.

Airport Information

The following information regarding accommodations was correct at press time but may have changed since then. Pilots are advised to contact airports of their choice directly, in advance, and to inquire about surface transportation to Dulles. Some airports will have shuttle service, others will not.

COLLEGE PARK, MD. **College Park Airport,** 28 miles east of Dulles UNICOM
One runway, 2700′ hard, lights, repairs
80/87 and 100/130 octane fuel
Phone: (301) 277-2102
20-30 tie-downs Overnight fee $2

GAITHERSBURG, MD. **Montgomery County Airpark,** 24 miles northeast of Dulles
One runway, 4200′, hard surface, UNICOM lights, repairs
80/87 and 100/130 octane and jet fuel
Phone: (301) 948-5300
25 tie-downs

GLASCOCK, VA. Four miles west of Dulles
Tower 120.5 (during show hours)
One runway, sod, 2600′, lights
80/87 octane fuel
Phone: (703) 327-6311
200-300 tie-downs

LAYTONSVILLE, MD. **Davis Airport,** 28 miles northeast of Dulles UNICOM
One runway, 2200′ hard, lights, repairs
80/87 and 100/130 octane fuel
Phone: (301) 253-2897
10-15 tie-downs Tie-down fee $1.00

LEESBURG, VA. **Arthur Godfrey Field,** 10 miles northwest of Dulles Tower 122.5
Ground 121.8 Dulles Approach & Departure
One runway, 3500′ hard, lights, repairs
80/87 and 100/130 octane fuel
Phone: (703) 471-4155
100-150 transient tie-downs (dry)

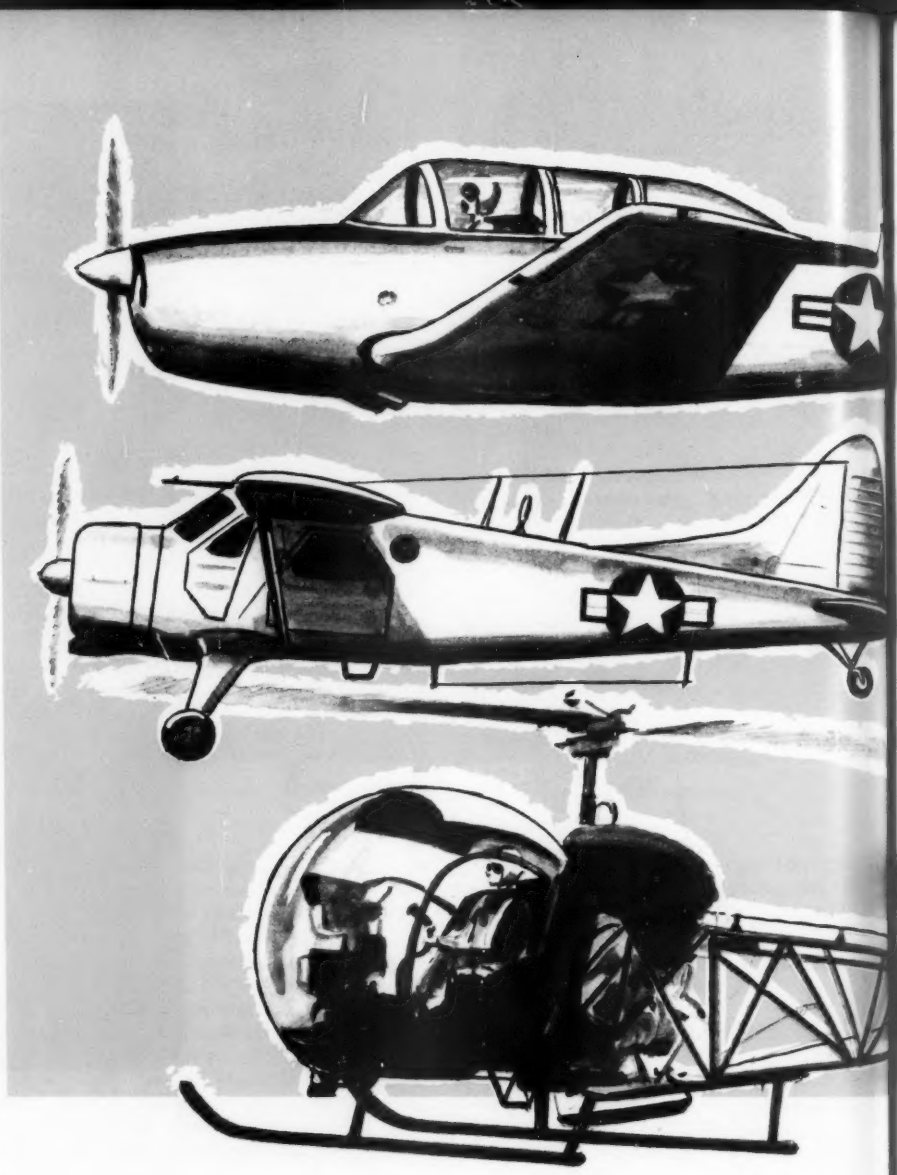
MANASSAS, VA. **Harry P. Davis Field,** 13 miles southwest of Dulles Tower: 122.4
Ground 121.6 Approach Control Dulles
One runway, 3700′ hard, lights, repairs
80/87 and 100/130 octane fuel
Phone: (703) 273-4940
300 sod tie-down spaces

MIDLAND, VA. **Warrenton-Fauquier Airport,** 28 miles southwest of Dulles UNICOM
Two runways, 2000′ and 4100′, hard, lights, repairs
80/87 and 100/130 octane fuel
Phone: (703) 788-4959 and 273-7733 (no toll)
200 grass parking places (Management hopes to have tie-downs available)
Fees $1 single, $2 twin

WOODBRIDGE, VA. **Woodbridge Field,** 18 miles south of Dulles UNICOM
One runway, 2200′, hard, lights, repairs
80/87 and 100/130 octane fuel
Phone: (703) 670-2166
50 parking places (dry)

Buying Military Aircraft

A Primer for Civilian Pilots



Everybody loves a bargain, and when it comes to second-hand birds, the biggest dollar bargain in sight may appear to be a surplus military aircraft. Take care—it could be "booby-trapped" with paper pitfalls.

The Department of Defense has made extensive use of helicopters and light observation planes in Vietnam and in training commands in this country. From time to time some of this equipment finds its way into the civilian market via surplus sales to the public. Would-be buyers should be aware of one important fact:

Before you can obtain an airworthiness certificate for any ex-military aircraft you—not FAA, not the Army, not the people who actually sold you the airplane—but you must obtain on your own an FAA type certificate or be able to show that it conforms to an existing civilian model that has an FAA type certificate, and you must prove that it is in a condition for safe operation (airworthy).

Depending on the type and history of the aircraft you acquire, this process could be relatively simple, involving only a few days of your time, or it could be extremely complicated, lasting months or even years. The road to certification is not exactly paved with red tape, but it can be pretty heavily papered with invoices, aircraft drawings, records, logbooks, and dozens of other documents which must be located, examined or filled out.

Advance information on upcoming sales is available from the Defense Surplus Sales Office, Dept. RK-24, P.O. Box 1370, Battle Creek, Mich. 49016. This office maintains a master list of all persons interested in bidding on surplus material, including their geographical location and particular interests, and provides them with an invitation to bid on appropriate offerings in their area. The invitation includes details on terms of sale, location of the property, description, quantity, dates of inspection, time and date of bid opening, removal of property etc.

The Department of Defense (DOD) sells two kinds of surplus aircraft. Some are sold for the purpose of flight (although not necessarily flyable at the time). Such aircraft are usually accompanied by service records and aircraft logs, or these are available to the purchaser. Other aircraft are sold for scrap or salvage, without accompanying records of any kind. This second group of aircraft may even be sold by the pound.

When a sale has been completed, the first problem is removing of the aircraft to the buyer's home base. If one is dealing with disassembled parts or nonflyable aircraft, these can simply be freighted to destination without any paperwork. But if the aircraft is to be flown, it must be registered. If you have ample time, you can obtain a registration form from the nearest Flight Standards District Office (FSDO), send in your application to the FAA Aircraft Records Center in Oklahoma City, Okla., and wait for an "N" number to be issued, and the registration returned.

Alternatively, you can telephone the Center and ask for an "N" number and have it reserved. Use the number on an application for registration, putting the appropriate copy of the application in the aircraft as a temporary registration and mailing the application, affix the registration number on the aircraft and apply to the nearest FSDO for a *special flight permit*. It is a good idea at this time to bring in enough documents regarding the aircraft so that its identity and condition can be established readily. In some cases, an FAA inspector may wish to see the bird before he authorizes you to fly it—which may well contribute to your safety.

Once your ex-warbird has been transported to your home airport, the process of "civilianizing" begins in earnest. You apply to your nearest FAA-EMDO (Engineering and Manufacturing District Office; these are

called AEDOs, Aircraft Engineering District Offices, in the Western Region). Establish the aircraft make and civil model and discuss information available in the Type Certificate Data Sheet or Aircraft Specification for your pertinent aircraft.

Conformity of your bird must now be established. Establishing conformity with the manufacturer's type certificate officially identifies the aircraft for civilian use. It confirms that the basic design is one which has been tested and approved by FAA.

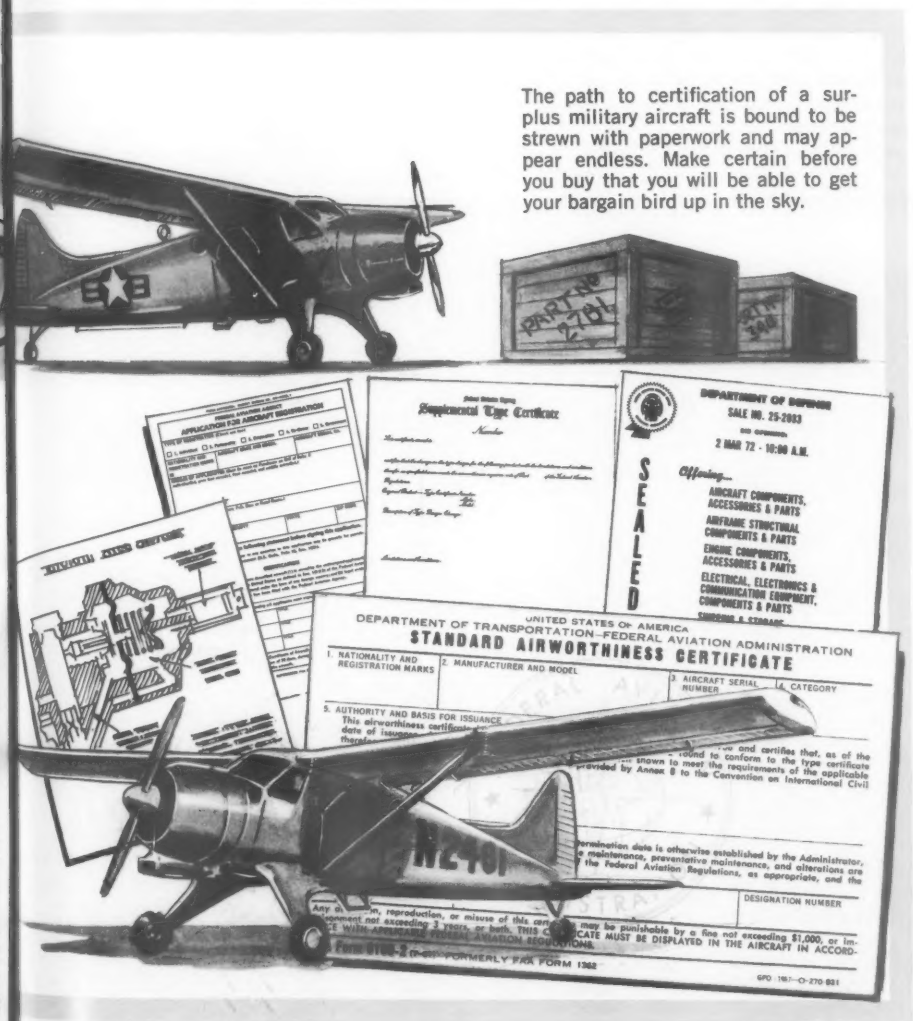
Your next consideration is the acceptability of any aircraft parts which have been replaced during the lifetime of the aircraft. Especially with helicopters, these are bound to be numerous, and certain parts have a "limited life" use period. If you are able to put your hands on all records and airframe and engine logbooks of your purchase, and these prove to be properly maintained, you should have a continuous record of all replacements. If not, you must track down each missing document.

The next big *if* is whether all replaced parts are approved for use on civil aircraft. The military frequently purchase quantities of aircraft parts from the lowest bidder, who may not hold a civil production approval. Such parts would not be FAA-approved. If this is true of your purchase, you now have the task of proving conformity of every non-approved part with the approved design. Depending on the critical importance of the part, you may do this with drawings and specifications, or testing of the part may be required.

Where this is not practical, since thorough testing would make many parts unusable, you might have to replace some non-approved parts with approved ones. Your task of proving conformity to a Type Certificate could be monumental. It is your responsibility to assure the FAA inspector that every single part was either made by the manufacturer who possesses a Type Certificate and a Production Approval, or that the part conforms fully to the approved component. When your purchase must be modified to conform, you must endeavor to prove, by means of drawings of virtually all component parts, that the accomplished modification does relate to that Type Certificate.

In the absence of logbooks and service records it may be necessary to produce an invoice for doubtful parts, which substantiates the part as approved for civil use, or to obtain a drawing, or perhaps to substantiate by testing. You must be prepared to compare the drawings of your ex-warbird parts with those of the type certificated parts and *prove conformance*. The inspector will want to check some of the parts in person. All of this can be a time-consuming process.

Where the type conformity has been established, but nevertheless certain non-approved modifications have taken place, you will have to apply for FAA approval of such changes. This might be true if, for example, you put a rig for spraying or dusting crops on a helicopter which was not certificated by the original manufacturer for such use.



The path to certification of a surplus military aircraft is bound to be strewn with paperwork and may appear endless. Make certain before you buy that you will be able to get your bargain bird up in the sky.

One Foot in the Cockpit

Once your aircraft's identity is clearly established *and* inspection has shown it to be in condition for safe operation, *and* you have conducted a weight and balance procedure, *and* an experimental certificate has been issued, you are allowed to set foot in the cockpit—but not for a joy ride. You are expected to flight test the ex-warbird in strict accordance with an FAA approved flight test procedure developed specifically for your aircraft. The flight test program should be coordinated with FAA for approval, prior to accomplishment. You must report on its performance to the FAA Engineering Flight Test Inspector, who may ask for additional flights and who will also flight test the aircraft. An application for a standard (or other) airworthiness certificate will be submitted to the EMDO following completion of satisfactory flight tests.

Only when that significant piece of paper is in your hand may you operate the aircraft at your own volition. (If your aircraft has been modified for a particular use, such as cropdusting, your airworthiness certificate may be restricted accordingly.)

The path to certification of a surplus military plane may seem unnecessarily long and tortuous, but it is based on the simple premise that an aircraft which is not known to be safely designed and constructed and in flyable condition can endanger the airspace and the general public. It is FAA's responsibility to prevent such hazards, but the agency does not have the manpower to research and establish the credentials of aircraft other than standard production type models. This is your part of the bargain when you buy a surplus military aircraft, and you have to live up to it before you can fly.

Famous
FLYERS

"Jepp" Jeppesen, as an air mail pilot for Boeing Air Lines, later United Air Lines.

The Boeing 40B took as much as 13 hours for the hazardous Cheyenne-Salt Lake flight in 1930.

Elrey Jeppesen

That little old mapmaker who charted the airspace of the world

On November 16, 1971, Elrey (Jepp) Jeppesen received FAA's Distinguished Service Award for outstanding contributions to the progress and safety of aviation, and on that occasion FAA Administrator John H. Shaffer commented: "I think I can say without fear of exaggeration that Jepp Jeppesen is just about the best friend we pilots ever had."

Jeppesen's unique contribution, accomplished in the midst of a busy career as an airline pilot, was the creation of the famous Jeppesen maps and charts, those invaluable navigation aids to airways and airports, which are used today by nearly all U.S. commercial airlines and many foreign airlines, as well as by about two-thirds of all instrument qualified business and executive pilots.

His aviation career, which spans 50 years, saw him log almost 20,000 hours of cockpit time and 3 million miles of flying, equal to 120 flights around the world. And as a businessman, he became a self-made millionaire, turning a ten-cent notebook into a firm which is the world's largest compiler and publisher of aerial navigation aids.

The son of a Danish cabinetmaker, Jeppesen's love of aviation began when he was still in his early teens in Portland, Ore. A group of flying barnstormers had come to town in 1921, offering to take people for plane rides at $25 a flight. Jepp, then 14 years old, went out to the airport with only $5 in his pocket, and spent all afternoon unsuccessfully attempting to get one of the pilots to take him up. But he persisted, and late in the afternoon a dapper ex-Army pilot finally gave in.

"Come on, kid, hop in. I'll take you up."

The ride only lasted ten minutes, but as young Jeppesen gazed down at the Columbia River from the sky he knew that flying was going to be his life.

He began to frequent the airport at Vancouver, Washington, across the river from Portland, working at odd jobs while he watched the planes, learning as much as he could about them. At age 18 he joined Tex Rankin's famed flying circus, first as a ticket seller, then as a prop twister, and finally as a wing walker and aerial acrobat. His aerial feats included swinging from the landing gear like some airborne monkey on a trapeze. The following year he learned to fly under the instruction of Basil Russell, and his original pilot's license was signed by Orville Wright. With $500 he had saved he purchased a World War I surplus OX-5 Jenny, an old biplane with a 90 hp engine, and a few months later he organized his own flying circus in Oregon and Washington.

During this learning period Jepp was also taking courses in engineering and mathematics, and studying photography as well. Soon he became adept at taking pictures from his plane. In 1928, when he was 21, he accepted an offer from the Fairchild Aerial Surveys Company as manager of their foreign photographic mapping division which was based in Mexico City. For the next two years he flew thousands of miles making the first photo mappings of the Mexican coast from Brownsville, Texas, to beyond the Yucatan Peninsula.

In 1930 he joined the Boeing Air Transport Company, forerunner of United Airlines, as an "airmail pilot" with the rank of captain. He flew the mail from Salt Lake City to Reno at first, but soon switched to the Cheyenne-Salt Lake route, the most dangerous and highest paying route in the system. During the single winter of 1930, four of the 20 pilots on the run were killed in plane accidents.

Jepp flew in an open cockpit Boeing 40-B biplane, wearing heavy flying togs, double boots and double mittens as protection against the cold and biting winds. Lacking modern navigational aids, the Boeing pilots frequently had to set down in the snow at one of several emergency fields along the route. On one trip when he was bucking western winds it took Jepp 13 hours (with frequent unscheduled stops for refueling) to get the mail through from Cheyenne to Salt Lake.

One morning when he was off duty, Jepp walked into a dime store in Cheyenne and purchased a ten cent notebook. He carried the notebook with him on all flights, jotting down every bit of pertinent information he could find—field lengths, slope, drainage pattern, obstacles, airport layouts, profiles of the terrain, data on beacons and lights, and even the phone numbers of farmers who could supply weather reports. He had no

Forerunner of the approach plate: a page from Jepp's original "Little Black Book", composed on a knee pad in an open cockpit mailplane.

idea at that time of commercializing his concept; he was merely collecting the information for his own personal use as a pilot. On his days off the meticulous Jeppesen would climb the hills and ridges in Wyoming with an altimeter in hand to obtain accurate data about safe minimum altitudes for an airplane crossing the area.

Jepp even climbed water towers in those early days to ascertain their exact height. He also measured smoke stacks and windmills in the vicinity of airports and established minimum circling altitudes for himself at all airports he used. When radio ranges were installed by the government in 1931 and 1932, he flew all legs of each installation and jotted into the notebook the safe letdown procedures for airports from Omaha and Cheyenne to Salt Lake City and Oakland.

Word soon began to circulate among those early pilots on the old airmail runs that Elrey Jeppesen had an amazing record of flight completions, and that one of the principal reasons was his "secret" manual on airports and landing procedures which he had compiled. They started to ask him for copies, and for a few years Jepp made copies of his sketches and charts and comments for his friends, but eventually the demand became so great that he was virtually forced into publication. He had discovered an aviation need which simply had to be satisfied.

He borrowed $450 and set up business in the basement of a house in Cheyenne where he was renting a room. In 1934 he published the first of his *Airway Manuals*, 50 mimeographed copies which sold for $10 each. The edition quickly sold out, and he continued to publish other editions, including more airways and airports in the volume.

Two years later he married a pretty stewardess from United Airlines, and she joined him in his field trips and publishing ventures. Jepp continued to fly as a captain for United Airlines while his business developed, and when he was transferred to Salt Lake City he was able to hire a small full-time staff, as well as a number of part-time engineers and mapmakers.

Although pilots soon came to regard Jeppesen's maps and charts as their Bible, it was some years before the commercial airlines adopted his manuals—they were reluctant to allow anyone but company executives to establish landing procedures. Nevertheless, Jeppesen continued to expand his service, and by the time World War II broke out he was the only person in the country who had such a huge compilation of nationwide flying information which was vital to the nation's defense. The Army quickly ordered a number of copies of his manual, and the Navy signed a contract with his firm.

During the war the standard Navy flying manual was adapted from Jeppesen's publications, and his flight manuals and profile charts helped keep the Navy fighters and bombers on course in Alaska and the Aleutians during a critical time of the war. After the war he continued to receive important contracts from the military flying services, and ultimately the commercial airlines began to adopt the Jeppesen charts and maps for their planes.

A Full-time Job

Jepp was still flying as a United captain in 1949 when the aviation industry awarded him the Certificate of Pilot Merit, naming him one of the top ten airline pilots in the air transport industry. But in 1954 he took early retirement so he could devote full time to his constantly expanding firm. By the end of the decade he was employing over 200 people in a new building he had constructed in Denver.

His files contained data on millions of miles of charted airways, diagrams of 8,000 airports, complete national weather interpretation, the latest information on approach patterns and takeoff and landing procedures, reports on hazardous obstacles, and full radar and electronic information.

In Jeppesen's contemporary operation, daily reports come piling into his Denver office, and the new information is processed and screened and classified immediately by experts. Within a matter of hours, skilled draftsmen can change an airport chart to show a new runway, or revise the radio call signals of an airfield control tower. Each change is put through five separate editing conferences before it is approved. After the final check, the revised chart or map is printed on a high-speed printing press in the building. The *Airway Manual* is published in a looseleaf binder, and each week new revisions are sent out to subscribers so that all the pilot need do is tear out the old pages and insert the new ones. Some weeks the number of drafting changes, which are often several to the page, can exceed 20,000.

In addition to his standard manuals, Jeppesen also developed a series of color maps which achieve a three-dimensional effect by depicting land and water in their true colors as they appear from the sky. These maps have been used by pilots to replace the old contour line maps; they have been purchased by commercial airlines to show their passengers the areas over which they are flying; and they have been used extensively in text books and encyclopedias.

Jepp also introduced a *Radio-Air-Route Guide* containing current radio navigation data for all charted airways, plus full data on airway traffic control procedures and civil regulations. This, too, is produced in a loose-leaf volume, with weekly mailings to subscribers to keep up with constant changes.

By 1960 over 5 million color relief maps were being produced annually at the Jeppesen firm in Denver. The Jeppesen relief map enabled navigators to measure true distance from point to point, on an orthographic plane. The firm opened a branch in Frankfurt, Germany, to supply similar information for Europe and Africa.

Jepp sold his firm to the Times Mirror Publishing Company in 1961 and moved over to become chairman of the board, a post he still retains, overseeing the worldwide operation. Today there are more than 80 million looseleaf pages in circulation in the thousands of Jeppesen manuals carried aboard aircraft; and there are in print several million large Jeppesen charts of low and high altitude airways.

At 65, Jepp still continues to fly, logging almost 200 hours a year over routes which he has made safer for all pilots. His alert mind is still seeking new ways of making aviation safer. FAA's Distinguished Service Award hailed him as "America's pioneer charter of airports and foremost mapper of skyways."

In 1929, when he was only 21 years of age, Jeppesen was barnstorming in the Yakima Valley of Washington in an OX-5 *Eagle Rock*.

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Personal Inspections

Checking the Chopper

Last in a series of six articles describing in depth "Sunday inspections" of light aircraft by non-mechanically oriented pilots, recommended as a safety precaution between annual inspections. Earlier articles covered the engine, controls, landing gear, wings, cockpit and exterior surfaces.

The propeller, known as the business end end of the airplane, is usually given a wide berth for very good reasons. Most of us learn fairly early in our piloting life that there is no such thing as an absolutely dead prop: A faulty ground in the magneto wiring can render any propeller "live" regardless of how the switches are set so we keep a respectful distance. We also tend to think of it as a relatively maintenance-free, foolproof component which, if we avoid bumping it or nicking it with gravel, will never cause trouble.

Accidents due to propeller failure are not numerous, according to National Transportation Safety Board records (out of 4,767 accidents in 1969, for example, 30 were attributed to prop failure), but they are potentially very serious.

One of the accident reports I examined described a prop failure on takeoff, after which the airplane spun out of control into the ground wiping out a row of parked aircraft and critically injuring several persons. Danger from the fragments of a broken prop are obviously greatest with multiengine aircraft or amphibians with wing-mounted engines. Incidents are on record of the fuselage being virtually severed by a flying propeller blade.

My own temerity on this subject was such that I conducted my preflight checks on the propeller at a distance of one yard, just out of harm's reach. To overcome my reluctance, I engaged an A&P mechanic to give me a half hour lesson on the care and maintenance of props, and he threw in a little theory and history as well.

His first suggestion, by way of reassurance, was that I lock the cabin doors as well as the panel switch before proceeding to an examination up front. This prevents someone, adult, child or animal, from wandering into the airplane and fiddling with the switches while I get wrapped up with the propeller. Then he showed me how to stand in reasonable proximity to the blades, not so far away that reaching for it pulled me off balance, and not so close that any part of my body was in range of its arc.

Most modern props, like mine, are made of aluminum alloy, which for durability is a great improvement over the old wooden props built up of laminated layers. Nevertheless, like all aluminum it is subject to slow, progressive corrosion; in fact, it is much more susceptible than the aluminum sheathing on the airplane because of the intense scouring effect of the airstream passing through the arc. Exposure to salty or industrially polluted air hastens corrosion; prevention, I was told, consists of frequent hosing down of the blades, wiping them dry and coating lightly with clean engine oil.

Given the sensitivity of aluminum, you do not want to use steel wool or any abrasive agent on the blades. If you like a bright finish, you can use ordinary metal polish, making certain to remove all traces of the material with a soft cloth.

For wooden props, cleaning with a mild soap and warm water is recommended. The protective coating of varnish will need replacing periodically, but do not make the mistake of varnishing one blade at a time. Propellers are so sensitively balanced that even that little difference in weight could cause harmful vibrations.

Symptoms of Stress

Cleaning the prop gives you a good opportunity to go over the blades manually for nicks, cracks or other damage. In the early days of metal airplane parts, when little or nothing was known about metal fatigue, there was no association of minor flaws with subsequent metal failures. But now engineers (and we students of maintenance) know that a hairline crack may be a serious symptom suggesting that the accumulation of stresses is beginning to exceed the strength of the part.

The stresses on a propeller are many, I was surprised to learn. To begin with, the prop is at the end of the energy chain; it is responsible for converting as much as possible of the brake horsepower of the engine into thrust. (The efficiency of propellers varies from as low as 50 percent to as high as about 87 percent.) During normal operating there are at least four separate kinds of stresses imposed on it: centrifugal force, torque, thrust, and aerodynamic force (see Figure 1).

Additional stresses may be imposed if the airplane is operated under conditions not suitable to the propeller or to the pitch setting. For example, if a light plane with a simple, fixed pitch prop designed for continuous operations on elevated terrain is operated for a long period at sea level, abnormal stress would be placed on the blades because they would be pitched to take a larger "bite" of air than is normal for ordinary use.

Similarly, with a controllable prop, operating beyond the range of recommended RPM/manifold pressure ratio could also eventually weaken the blades, as well as the engine.

Other stresses could be derived from any distortion in the position or movement of the blades, resulting in *fluttering*, or other vibrations. Fluttering is a rotary movement of the blade tip around an axis perpendicular to the propeller shaft; it produces a vibratory noise similar to exhaust roar. Fluttering may sometimes be detected by observing the propeller arc from the side when the engine is idling at 1,200 to 1,500 RPM (make sure, I was warned, that a qualified pilot or mechanic is in the cockpit).

Another type of vibration is caused by uneven *tracking* of the blades. Tracking can be easily checked by using a yardstick or pole to measure the distance from a given point on the leading edge of the wing to a (motionless, naturally) blade tip. The propeller is then rotated around to bring the opposite tip into a position to be measured. The two measurements should coincide very closely.

If a propeller does fly apart in flight, leaving one of the blades in the hub, the ensuing vibrations are apt to break the engine right off its mounts, unless you act swiftly to stop the rotation. Just cutting

the ignition is not enough. Unless the prop remnant can be stopped, the airspeed at normal cruise or glide will cause enough windmilling to make the engine shudder. Pull the airplane up immediately into a near stall attitude (assuming you have safe altitude) until the propeller shaft stops rotating. If you then hold the airplane to no more than a safe gliding speed, cylinder compression and inertia should prevent the stub from spinning again.

My question, in the face of all this sobering advice, was how do I, a conscientious pilot/owner, *prevent* propeller failure?

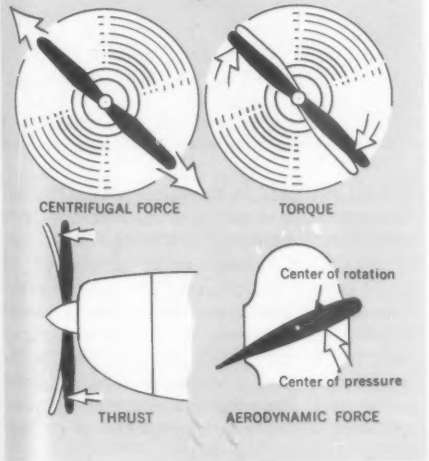
Report unusual vibrations in the engine; do not overload the prop; keep it clean, oiled, and away from gravel, and the propeller should outlast the airplane and possibly the pilot as well, I was reassured.

Visualizing the stresses that may be exerted on the propeller helps a pilot understand why a simple nick or dent on the blade can weaken it enough to lead to eventual failure. Only an experienced mechanic can tell you whether the flaw is serious. He may decide to let it be for a while; he may want to file it into a shallow depression; or he may insist on yanking the prop.

Incidentally, the propeller *spinner* is more than a decorative item. On airplanes like mine, it serves to direct air over the engine for cooling purposes: the engine should not be operated without the spinner in place. Maintenance, I was shown, consists of tugging at it to make certain it is securely fastened in place and checking for oil streaks —a likely symptom of a leaking hub seal.

This being the last of my six consecutive Sunday inspections, I closed the book on my personal inspection log and put it away to rest until the next spate of wintry weather prompts me to spend some unhurried hours on the ground with my airplane. But the maintenance notes were carefully filed away, in my head as well as on paper, and I knew that my preflight inspections would never again be as casual as in the past. Knowing what to look for makes a difference.

Fig. 1



Pilot BRIEFS

■ REPAIR STATIONS. **All FAA certificated repair stations as of July 1, 1971, are listed in a revised advisory circular, AC 140-1F. The facilities are coded to indicate the services performed at each, such as powerplant, propeller, instrument, etc. Copies of the directory may be obtained from DOT/FAA Distribution Unit, TAD 484.3, Washington, D.C. 20591. Information about a specific repair station should be addressed to the repair station at the address shown in the listing.**

■ VASI APPROACHES AND WAKE TURBULENCE. **FAA is eliminating references in Part I of the Airman's Information Manual which may imply that using the higher (white-white) angle of the VASI will necessarily provide a safe approach path when landing a small airplane behind a heavier one. The point was raised by a letter from reader T. D. Weldin appearing in the February 1972 issue of FAA AVIATION NEWS concerning an FAA written examination question on this subject. The proper reply to this letter, contained and diagrammed in Advisory Circular 90-23B, should have pointed out that since the following pilot could not determine the flight path of the preceding heavy aircraft in relation to the VASI, he would have to adjust his approach angle so that he remained at all times at or above the other airplane's flight path, and landed beyond his touchdown point.**

A white-white VASI reading would not necessarily protect him from wake turbulence under some circumstances, since the preceding airplane might, in fact, not be using the VASI at all. Incidentally, the apparently ambiguous test question is also being deleted from subsequent examinations.

■ BRIGHT LIGHTS. **Light measurement for aircraft position and anticollision lights is discussed in a new FAA Advisory Circular, AC 20-74. Developed as a reference for those concerned with data on measurements of aircraft lights, the circular contains material on the properties of light, types of measurements and descriptions of the equipment used to make them, and precautions to be observed. Free from DOT/FAA Distribution Unit.**

■ BY INVITATION ONLY. **Air Force Regulations governing civilian use of military air bases have been revised in AFR 55-20. Unauthorized landing by a light plane (less than 12,500 lbs.) will cost $100— up to $250 for heavy aircraft. Base commanders have the authority to approve civil use of the military fields when AF Form 181 is supplied, and the proper amount of liability insurance is in effect. Application should be made well in advance (at least 30 days) and will normally be approved only "for good reason," in which case the fee for a light aircraft would be $5.**

Long Range Plan for Microwave Landing System Published

FAA has published a long range plan for developing and installing microwave landing systems at general aviation and air carrier airports across the nation.

Unlike present instrument landing systems which provide a single approach path, the microwave landing system (MLS) provides a number of available flight paths. Increased airport acceptance rates as well as a reduction in noise at surrounding communities are other benefits of the system.

The MLS is also less subject to siting and interference problems than present equipment and therefore can be installed at less expense at airports with uneven terrain. Microwave systems provide continuous distance information to the pilot, eliminating the need for marker beacons on final approach.

Ground and airborne equipment will be developed by industry under FAA/DOD supervision in accordance with the "National Plan for Development of the Microwave Landing System," AD 733-268, available for $3.00 from the National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22151.

Pilots Reminded to File Flight Plans for ADIZ Flights

General aviation pilots planning to fly in an Air Defense Identification Zone (ADIZ) are reminded by a new FAA advisory circular that failure to file and adhere to a flight plan may lead to interception by Air Force jets. An ADIZ is an area of airspace over land or water (generally off the U.S. border or coast) where positive and quick identification, location and control of civil aircraft are deemed necessary to national security.

North American Air Defense Command (NORAD) has the responsibility to identify ADIZ air traffic as friendly, unknown, or hostile—a simple matter if flight plans are filed and followed. Otherwise it may be necessary to send interceptor aircraft to identify planes, which is costly to the United States and unsettling to pilot and passengers.

Recommended practices for operating in an ADIZ include: file a flight plan, either in person at the FSS or by phone before takeoff; depart within five minutes of time specified in flight plan, and maintain speed to penetrate ADIZ or reach reporting point at estimated time (or update flight plan accordingly); maintain course within 10 miles of centerline of the flight planned route; make sure two-way radio is operative.

Specific rules for flying in an ADIZ are spelled out in FAR Part 99, and pertain to radio and flight plan requirements, position reporting, and deviation from flight plan or ATC clearances.

Advisory Circular AC 99-1 may be obtained free from DOT Distribution Unit, TAD 484.3, Washington, D. C. 20591.

TV Camera Scans Mountain Weather

The value of using a remote TV camera to report on weather conditions in mountainous areas will be tested by FAA in Stampede Pass, 80 miles east of Seattle, Wash., on the VFR route through the mountains. A standard TV camera will scan the approaches to the pass and provide live TV pictures of current weather conditions (snow, fog, rain, haze) on a monitor in the Seattle FSS. The camera data will be compared with actual observations at the manned weather observation post in the pass.

If the experiment proves successful, remote TV weather monitor systems will be installed at (unmanned) isolated locations where obtaining up-to-the-minute weather information is a problem for pilots.

A & P Mechanic Test Guide Revised

A newly revised guidebook has been published for prospective A & P mechanics. The guide provides information on certification requirements, application procedures, and written oral and practical tests for A & P mechanics. Included are 50 sample written test questions as well as recommended study materials and the location and phone number of each FAA regional and district office.

The guide may be obtained at Government Printing Office bookstores or from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Specify FAA Advisory Circular 65-2B, Airframe and Powerplant Mechanics Certification Guide, catalog number: TD 4.8:Ai 7/6/971. The cost is 65 cents per copy.

FAA Seeks Digitized "Super VORs"

A request for proposals (RFP) for the development of VOR equipment ten times more accurate than existing systems has been issued by FAA. The request calls for a digital VOR signal to be transmitted from the present VOR stations and multiplexed on existing VOR signals so that pilots could continue using the navigation equipment presently in their planes while the new equipment is phased in.

NO HUNTING. A recently enacted Federal Law prohibits hunting from aircraft, with maximum penalties of a $5,000 fine, a year in prison, or suspension or revocation of pilot's license. Public Law 92-159 amends the Fish and Wildlife Act of 1956 to forbid shooting or harassing with an aircraft any bird, fish or other animals. (Aircraft is interpreted as "any contrivance used for flight in the air.") Specifically exempt are persons operating under a permit to aid or protect wild or domestic animals.

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.

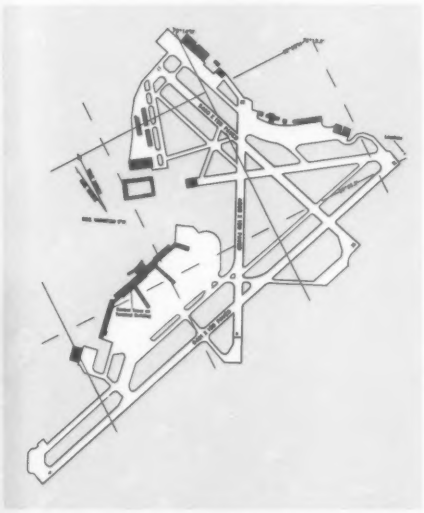
• Front and Back Courses

Philadelphia International Airport has instrument landing system (ILS) approaches for Runways 9 and 27, and also a localizer back course (LOC BC) approach for Runway 27, all using the same localizer frequency of 109.3. This means that on one frequency there is an ILS operating off of each end of Runway 9-27, and a back course operating off one of them. This seems like a confusing situation. Why is a back course approach for Runway 27 necessary when there is a front course ILS for that runway?

When landing on Runway 27, how does a pilot know whether the ILS or back course approach is being used? If one of these approaches is in use, is the one at the other end of the runway also in operation, and if not, how is it inactivated?

When ILS RWY 27 is in use, is a back course being radiated along RWY 9? If so, why is it not published as an approach?

West Lafayette, Ind.



Occasionally you will find both an ILS and a back course approach on one runway. At Philadelphia there was originally an ILS on Runway 9 with a back course approach for Runway 27. When the ILS for 27 was established the old back course approach was left in the books and serves as a backup for the 27 ILS. (Although it is rarely used it came in handy when the Runway 27 ILS was knocked out during a recent power failure.)

Because of frequency shortages one frequency is often used for ILS's on opposite ends of a runway, but an interlocking device prevents the two systems from simultaneous operation.

Usually when an ILS is operating, a signal is being radiated on the back course, but unless it has been flight checked and certificated for navigational use it may not be safe to use, and it is not published as a "back course approach." (On the back course, you will remember, you fly "away from the needle" on the ILS indicator. If the needle is deflected to the right, you fly left to center it, and to get back on course.)

In his clearance the pilot is specifically told which approach is being used. He will be "cleared for ILS Runway 27 approach" or "cleared for a localizer back course Runway 27 approach." To eliminate any possible confusion the name of the approach as it is given in the clearance will be identical to that listed on the instrument approach plate to be used. If there is an ATIS operating at the airport it will also advise what type of approach is being conducted as well as the runway to be used.

• Louder Than Words

I am a 35-hour student pilot and was recently given an old copy of FAA AVIATION NEWS (October 1970) with the comment that safety was consistently emphasized. After reading your reply to a letter concerning nonstandard pattern altitudes which created a seemingly hazardous situation at two airports . . . it seems to me like a little more direct action on your part would have been justified instead of your advice to write to the agency involved after which a study would be made. It would seem worthwhile, once a hazard has been recognized and pointed out, to immediately take whatever steps are necessary to alleviate the danger.

Carl D. Brandt
Ann Arbor, Mich.

The Federal Aviation Administration prefers to have a representative in the field close to the situation discuss local problems with local users of the airspace rather than to impose procedures from a distance. You will recall in this connection that the reader specifically asked for the appropriate local FAA contact to observe the non-standard traffic pattern altitudes in question. We published this information as a means of being helpful to other readers with similar problems (FAA's local offices were immediately alerted to the situation).

FAA has issued a proposal to establish standard traffic patterns, pattern altitudes, and entry procedures for uncontrolled airports in an effort to eliminate this type of problem. (See FAA AVIATION NEWS, August 1971, "Squaring the Circle.")

• Watch Your Altitude

In "How is the Weather Out There?" in FAA AVIATION NEWS, December 1971/January 1972, you say, "I'm VFR at 6,000 feet." I suggest your writers read your FAR's before soloing with a typewriter.

W. C. Palmore
Bowling Green, Ky.

You are correct. A proper cruise altitude (for a westerly heading) would have been 6,500 feet. Edited out of the article (for reasons of space limitations) was reference to the fact that the pilot was descending from a higher altitude in deference to the clouds ahead.

• VA Eligibility

I enjoyed your article "VFR + VA = IFR" (November 1971). I would like to interject that one does not have to possess a private pilot's license to be eligible, but need only meet the flight hour requirements for the private rating.

The VA assisted me in obtaining my commercial license and instrument, multi-engine, flight instructor ratings (airplane and instruments) and rotorcraft-helicopter. It's a great program for aviation-minded veterans.

James G. Duea
Rosemount, Minn.

Although at one time having the flight hour requirements for a private license was acceptable in lieu of the license itself, this is not now true. Veteran's Administration Form 21E-1990, "The Veteran's Application for Program of Education or Training" clearly states that in order to receive pilot training (available for advanced instruction only) the applicant must "furnish to the school evidence of a valid private pilot's license" along with the pertinent medical certificate.

• The Shadow Knows

Your recent article about taxiing an airplane ("Aeronautical Fender Bending", FAA AVIATION NEWS, December/January) prompts me to pass on a taxi hint that was given me by a wise instructor. To insure wingtip clearance when moving about on a crowded ramp, watch the shadows on the ground. When wings are at the same height above the ground and the shadows do not overlap, you have clearance. (If they are not at the same height, they'll clear anyhow.)

J. Byers
Leesburg, Va.

• Grass for Runways

I would like to know which types of grass are recommended for aircraft runways. I plan to build a grass runway on my farm in southeastern Kansas.

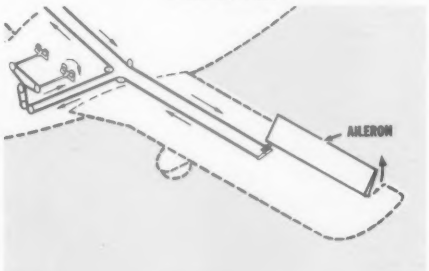
Dale W. Peters, M.D.
Wichita, Kan.

Because of the many varieties of vegetation and climate which prevail in our country it would be difficult for us to advise you from here. We suggest you consult your state or county agricultural authorities, or contact the Chief of the Airports Division via your nearest FAA local field office.

• The Inspector Inspected

In your November article "Second Sunday" concerning control cable inspections, the control wheel is illustrated as rotated to the left, with a resultant elevation of the right, not left, aileron. With that rig, all the meticulous inspection described might have gone for naught at the moment of a crosswind takeoff.

Dr. Fred Miley
Miami, Fla.



To say the least. This is a graphic example of why it is extremely important, whenever you rent or borrow a plane, or get one back from the shop, to make sure during the preflight inspection that whenever you turn the the wheel to the left, the left aileron goes up—and vice versa.

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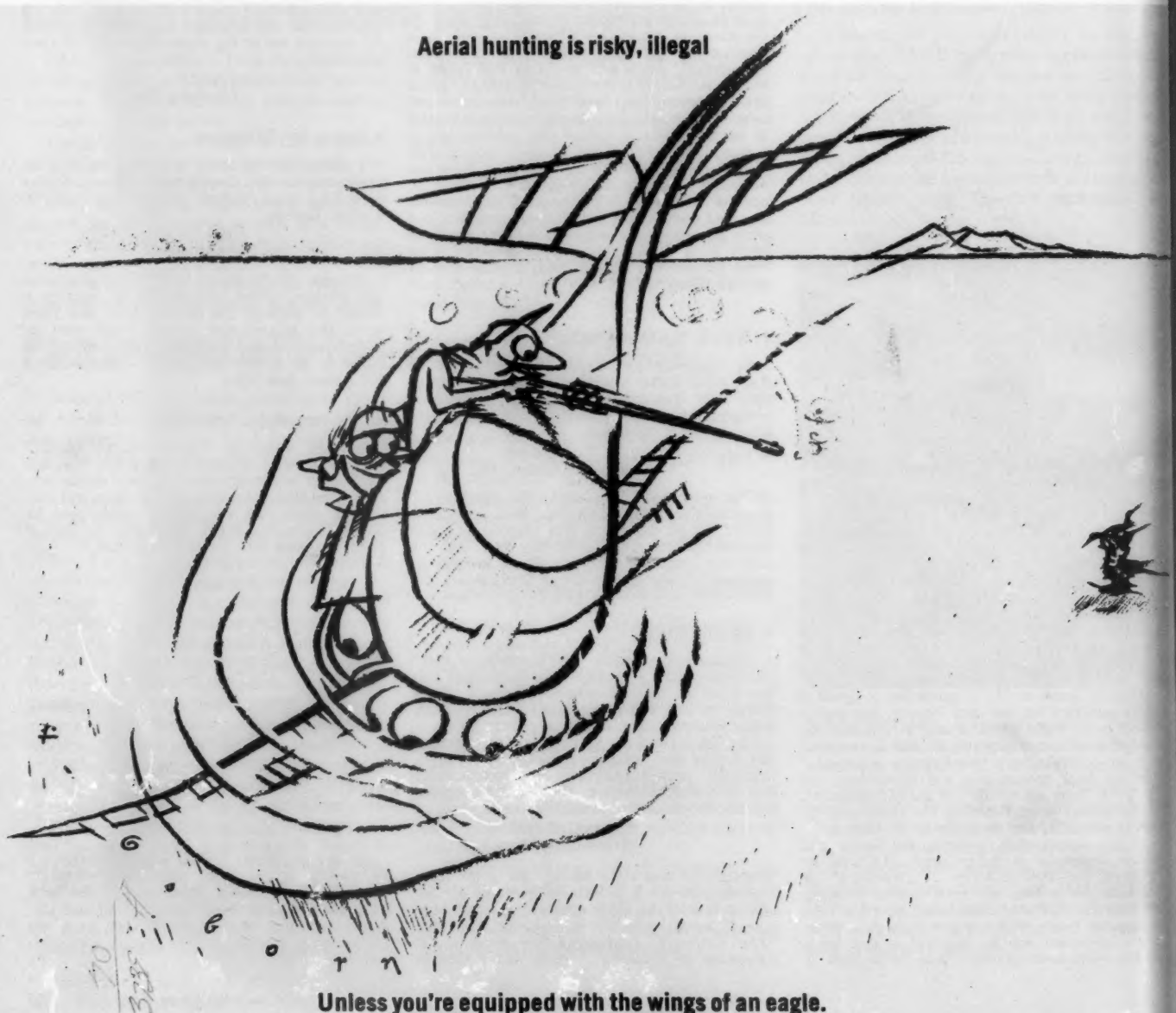
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